

AMENDMENTS TO THE SPECIFICATION

IN THE TITLE:

COMMUNICATION SYSTEM USING DIGITAL WATERMARK FOR
~~SYNCHRONISING~~ SYNCHRONIZING MULTIPLEXED TEXT DATA TO
VIDEO FRAMES

Paragraph at page 1, lines 11-22:

For standard digital television broadcasting, it is contemplated to multiplex text data with a video signal using vertical blanking intervals. For this purpose, a number of text data are multiplexed in a video program and each text data stream is associated with a particular series of video frames, or “events” so that each text appears on the screen of television receivers simultaneously with the associated event. In order for television receivers to ~~synchronise~~ synchronize a text data stream with the associated event, it is necessary for the broadcasting station to transmit timing information along with a video signal, as disclosed in Japanese Laid-Open Patent Application 11-27641. However, the use of timing information represents a waste of resource of the video frequency spectrum.

Paragraphs at page 2, lines 4-23:

It is therefore an object of the present invention to provide a system and method for ~~synchronising~~ synchronizing text data streams to “events” of digital video stream without using timing information.

The stated object is obtained by embedding a digital watermark in the transmitted video stream and detecting the digital watermark in the received video stream and using it as a timing signal for ~~synchronising~~ synchronizing a text data stream to associated video frames.

According to one aspect of the present invention, there is provided a digital video communication system comprising, at a source site, an embedding circuit for embedding a digital watermark in a digital video stream to produce a watermarked digital video stream, and a multiplexer for multiplexing a text data stream with the watermarked digital video stream to produce a multiplexed signal. At a sink site, the system includes a demultiplexer for demultiplexing the multiplexed signal for recovering a watermarked digital video stream and a text data stream. A digital watermark detector is provided for detecting the digital watermark embedded in the recovered digital video stream. A ~~synchroniser~~ synchronizer responds to the detected digital watermark for ~~synchronising~~ synchronizing the recovered text data stream to the recovered video stream.

Paragraphs at page 5, line 24 to page 6, line 13:

The text data recovered by data expansion circuit 36 is supplied to a memory or ~~synchroniser~~ synchronizer 37 and the MPEG-2 transport video stream recovered by the video expansion circuit 38 is supplied to a watermark detector 39 to detect the watermark embedded in the video stream in a manner as disclosed in the aforesaid Japanese laid-open patent application.

The detected watermark signal is used by the memory 37 as a read timing signal for reading the stored text data so that it is ~~synchronised~~ synchronized to a series of desired video frames. The detected watermark is also supplied to a copy protect circuit 40 to produce a copy management signal that is used to protect video programs from being illegally copied by ~~unauthorised~~ unauthorized users. The copy management signal is embedded in the video stream from video expansion circuit 38 as a digital watermark by an embedding circuit 41 to protect a series of video frames from ~~unauthorised~~ unauthorized duplications.

Paragraph at page 6, lines 16-24:

An example video stream is shown in Fig. 2 in which multiplexed text data 1 and 2 occur at such timing that the memory 37 can operate alternately in a write mode and a read mode. Two watermark signals are shown embedded in a video stream for ~~synchronising~~ synchronizing text data 1 to a series of video frames 1 to 4 (event 1), and ~~synchronising~~ synchronizing text data 2 to a series of video frames 5

to 8 (event 2). When the video stream is displayed on the display stream 42, the event-1 video frames 1 to 4 will be overlaid with text data 1 and the event-2 video frames 5 to 8 will be overlaid with text data 2.

Paragraph at page 7, lines 9-15:

In a further modified embodiment shown in Fig. 5, the copy protect circuit 40 is replaced with a watermark converter 44 in which the watermark signal detected by the watermark detector 39 is altered into a form that can be detected as a copy management signal to protect specified video frames from being illegally copied by ~~unauthorised~~ unauthorized users. The output of watermark converter 44 is combined with the output of video overlay unit 43 in the embedding circuit 41.